



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/583,115

06/16/2006

Brian Stephen Kimberley

4702-45

1241

23117

7590

02/02/2009

NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

LEE, RIP A

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

02/02/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,115	Applicant(s) KIMBERLEY ET AL.	
	Examiner RIP A. LEE	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-20 and 22-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-20 and 22-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1796

DETAILED ACTION

This office action follows a response filed on January 16, 2009. Claims 17-20 and 22-32 are pending.

Claim Rejections - 35 USC § 102 / 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 17, 18, 20, 22-24, and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Nowlin *et al.* (U.S. 5,332,706).

Nowlin teaches a process in which a first stage product comprising a supported catalyst of $\text{Bu}_2\text{Mg}/\text{TiCl}_4$ on silica is isolated as a free flowing powder having a pore volume of $1.5 \text{ cm}^3/\text{g}$. To a 492-g sample of this product (total pore volume = $(492 \text{ g})(1.5 \text{ cm}^3/\text{g}) = 738 \text{ cm}^3$) was added 13.93 g of $(\text{BuCp})_2\text{ZrCl}_2$ in 717.5 mL of MAO/toluene. The solution is added to the product in 5-mL aliquots, during which time the product remains completely dry and always consists of a free flowing powder. This sequence of events takes place prior to introduction of the supported catalyst into a fluidized bed gas phase reactor. Catalyst is used in a process for copolymerization of ethylene with hexene (see col. 13, lines 15-35 and 43-50).

For this analysis, it is reasonable to approximate the 5-mL aliquot of $(\text{BuCp})_2\text{ZrCl}_2/\text{MAO}$ as a 5-cm^3 aliquot of toluene. After addition of the first aliquot, the inert hydrocarbon, toluene, is present in an amount of $(5 \text{ cm}^3)(100)/738 \text{ cm}^3 = 0.68 \%$ of the total pore volume of support.

Alternatively, a new supported catalyst is formed after addition of the first 5-mL aliquot of $(\text{BuCp})_2\text{ZrCl}_2/\text{MAO}$. The resulting material is still in the form of a free flowing powder, and addition of the second aliquot (approximately 5 cm^3 of toluene) equates to adding inert hydrocarbon in an amount of about 0.68 % of the total pore volume of support.

In either embodiment, the claimed step of adding inert hydrocarbon to supported catalyst in form of powder in an amount of up to about 10 % of pore volume is fully met.

Art Unit: 1796

It is maintained that reduction of fines occurs since Nowlin *et al.* teaches that this incipient impregnation method substantially eliminates the problem of fluidized bed reactor fouling (abstract).

3. Claim 31 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nowlin *et al.*

The discussion of the disclosures of the prior art from the previous paragraph of this office action is incorporated here by reference. Nowlin *et al.* does not quantify the size of reactor foulant, however in view of the fact that the prior art process is substantially the same as that recited in the instant claims, and in light of the fact that the invention of Nowlin *et al.* is directed to reduction of reactor fouling, a reasonable basis exists to believe that the claimed reduction of fines is observed. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

4. Claims 17-20, 22-24, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brinen *et al.* (U.S. 5,721,184) in view of extrinsic evidence furnished by Speca *et al.* (U.S. 5,786,291).

Brinen *et al.* discloses a process for preparing supported metallocene catalyst. The method involves a technique for evenly distributing a small volume of catalyst component over and among a porous support, resulting in reduction of fouling, or “fines” (abstract, col. 1, lines 26-32). Antistatic agents are also added to the supported catalyst system while the catalyst is in the free flowing state (col. 6, lines 1-9). Example 3 shows that a 160 g of AS990 antistat in toluene is added to supported catalyst containing metallocene, MAO, and 50 lbs (22,680 g) of Davison MS948 silica, having a pore volume of 1.5-1.6 cm³/g (see Speca *et al.*, col. 16, line 40), as the carrier. The total pore volume of catalyst is (22,680 g)(1.5 cm³/g) = 34,020 cm³. The volume of toluene added is (160 g)/(0.867 g/cm³) = 184 cm³, which corresponds to 0.54 % of the total pore volume of catalyst and is considerably less than 10 % of the total pore volume, as

Art Unit: 1796

claimed. Polymerization of ethylene and 1-hexene in the presence of the catalyst is carried out in a continuous fluidized bed gas phase reactor (col. 13, lines 27-35).

While the working example does not show addition of antistatic agent to dried, supported catalyst, it would have been obvious to one having ordinary skill in the art to prepare supported catalyst, dry to free flowing state, and then add antistatic agent to the dried catalyst because the inventors teach that another method of preparing the catalyst is to add antistatic agent to the catalyst in the free flowing state. Accordingly, one having ordinary skill in the art would have expected this variation to produce an equally effective catalyst with a reasonable expectation of success. In sum, the subject of claims 17, 18, 20, 22-24, and 29-31 are obvious over the disclosure of Brinen *et al.*

With respect to claim 19, Brinen *et al.* discloses no preference with respect to the type of solvent used to add antistatic agent. The routineer in the art gleans from the disclosure that inert hydrocarbon solvents such as toluene, ethylbenzene, xylene, hexane, and isobutene are utilized in such polymerization processes (col. 10, lines 45-48). One having ordinary skill in the art would have made the connection that any of these hydrocarbon solvents may be used as diluent for the antistatic agent. Thus, in absence of any showing of criticality or unexpected results, it would have been obvious to one having ordinary skill in the art to add to the supported catalyst a solution of antistatic and hexane, and since hexane is merely the carrier solvent, the skilled artisan would have expected the catalyst to work in reducing fines with a reasonable expectation of success.

Brinen *et al.* does not quantify the level of fines in terms of particle size, as recited in instant claim 32. However, in light of the fact that the object of the invention is to reduce reactor fouling, and in view of the fact that the references makes obvious the process recited in the instant claims, and further in view of the fact that the cited example states that no significant reactor fouling was observed, a reasonable basis exists to believe that fines having the recited particle sizes are, at the very least, "reduced," as recited in the claim. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Art Unit: 1796

5. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brinen *et al.* in view of Canich *et al.* (U.S. 5,075,475).

The discussion of the disclosures of the prior art from paragraph 4 of this office action is incorporated here by reference. Brinen *et al.* teaches that the inventive process for preparing supported catalyst is applicable to known catalysts such as those disclosed in Canich *et al.*, U.S. 5,075,475, the disclosure of which is fully incorporated by reference (col. 3, line 45). Turning to the secondary reference, Canich *et al.* teaches polymerization of olefin(s) in the presence of a supported constrained group metallocene-like catalyst such as $\text{Me}_2\text{Si}(\text{C}_5\text{Me}_4)(\text{N-}t\text{-Bu})\text{ZrCl}_2/\text{MAO}$ (Table 1, col. 11, line 15, example 1). Preparation of supported catalyst and its use in prepolymerization is disclosed in col. 15, lines 24-67. Polymerization reactions are also carried out in a fluidized gas phase reactor (col. 16, lines 29-32). The combination of references would have suggested to one having ordinary skill in the art that the catalyst of Canich *et al.* may be modified according to the process of Brinen *et al.* in order to reduce reactor fouling during polymerization. Therefore, it would have been obvious to one having ordinary skill in the art to make the catalyst of Canich *et al.* according to the process of Brinen *et al.*, and since the process appears general and applicable to a variety of catalyst, one having ordinary skill in the art would have expected such a modification to work with a reasonable expectation of success. The combination is especially obvious since Brinen *et al.* contemplates that the catalysts of Canich *et al.* are useful for practicing the invention.

6. Claims 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brinen *et al.* in view of Stevens *et al.* (U.S. 5,064,802).

The discussion of the disclosures of the prior art of Brinen *et al.* from paragraph 4 of this office action is incorporated here by reference. Brinen *et al.* teaches that the inventive process for preparing supported catalyst is applicable to known catalysts such as those disclosed in Stevens *et al.*, U.S. 5,064,802, the disclosure of which is fully incorporated by reference (col. 3, line 45). Turning to the secondary reference, Stevens *et al.* teaches polymerization of olefin(s) in the presence of a supported catalyst prepared from a constrained group metallocene-like complex of general formula $(\text{Cp}^*)\text{-Z-Y-M}(\text{X})_n$ (claims 1-5) and ionic activator of formula $(\text{L-H})_d^+[\text{A}]^{d-}$

Art Unit: 1796

(claims 6-10). The combination of references would have suggested to one having ordinary skill in the art that the catalyst of Stevens *et al.* may be modified according to the process of Brinen *et al.* in order to reduce reactor fouling during polymerization. Therefore, it would have been obvious to one having ordinary skill in the art to make the catalyst of Stevens *et al.* according to the process of Brinen *et al.*, and since the process appears general and applicable to a variety of catalyst, one having ordinary skill in the art would have expected such a modification to work with a reasonable expectation of success. The combination is especially obvious since Brinen *et al.* contemplates that the catalysts of Stevens *et al.* are useful for practicing the invention.

7. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brinen *et al.* in view of Jacobsen *et al.* (U.S. 5,834,393).

The discussion of the disclosures of the prior art of Brinen *et al.* from paragraph 4 of this office action is incorporated here by reference. Brinen *et al.* teaches that the inventive process for preparing supported catalyst is applicable to a wide variety of known catalysts (col. 3, line 1-56), but there is no teaching of the catalyst recited in the instant claims. Jacobsen *et al.* teaches preparation of a supported catalyst system comprising a constrained group metallocene-like catalyst and a borate activator containing at least one active hydrogen. The catalyst system $\text{Me}_2\text{Si}(\text{C}_5\text{Me}_4)(\text{N}-t\text{-Bu})\text{Zr}(\eta^4\text{-C}_5\text{H}_8)/[\text{Et}_3\text{NH}][\text{B}(\text{C}_6\text{F}_5)(\text{C}_6\text{H}_4\text{-OH})]$ is exemplary (example 20). Inventive supported catalysts can be subjected to prepolymerization (col. 22, line 63), and they are sufficiently stable for use in gas phase polymerization (col. 23, lines 35-55). The combination of references would have suggested to one having ordinary skill in the art that the catalyst of Jacobsen *et al.* may be modified according to the process of Brinen *et al.* in order to reduce reactor fouling during polymerization. Therefore, it would have been obvious to one having ordinary skill in the art to make the catalyst of Jacobsen *et al.* according to the process of Brinen *et al.*, and since the process appears general and applicable to a variety of catalyst, one having ordinary skill in the art would have expected such a modification to work with a reasonable expectation of success. The combination is especially obvious since Brinen *et al.* contemplates that the catalysts of Jacobsen *et al.* are useful for practicing the invention.

Art Unit: 1796

Response to Arguments

8. Applicant traverses the rejection of claims based on Brinen *et al.* (U.S. 5,721,184, hereinafter “Brinen”), set forth in this office action and the previous office action dated October 16, 2008. Applicant submits that the Brinen discloses of addition of catalyst solution in an amount of preferably less than 1.5 times the pore volume of support rather than the inert hydrocarbon liquid recited in the instant claims. Applicant further submits that the supported catalyst in the working example, at the time antistatic in toluene is added, is not in powder form. These facts are appreciated, however, the rejections based on Brinen are not concerned with catalyst solution. Furthermore, the rejection is based on the premise that the person of ordinary skill in the art would have found it obvious to add antistatic/toluene to dry, supported catalyst, which would be in powder form, because Brinen specifically discloses that antistatic agents are also added to the supported catalyst system while the catalyst is in the free flowing state (col. 6, lines 1-9). Applicant’s argument that no antistatic compound is required in the present invention is not persuasive and does not address why adding antistatic to supported catalyst in powder form would not have been obvious to one of ordinary skill in the art. Applicant has not addressed why the skilled artisan would not have found it obvious to use catalyst systems cited in Canich *et al.*, Stevens *et al.*, and Jacobsen *et al.* Finally, Applicant has not met the burden of proof in establishing an unobviousness difference with respect to efficacy in reduction of fines. Thus, in light of these considerations, the rejections have been maintained.

Conclusion

9. This office action presents new grounds of rejection, and therefore, the action is made non-final.

Art Unit: 1796

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Art Unit 1796

January 30, 2009